

Chapter 2

The Hydrologic Engineering Management Plan

2-1. General

The HEMP is a technical outline of the hydrologic engineering studies necessary to formulate a solution to a water resource problem. A HEMP could be an initial or detailed work outline. An initial HEMP is developed to define key issues and activities sufficient to address study time and cost. A detailed HEMP outlines significant technical activities in sufficient detail for the responsible engineer to perform the analysis.

2-2. Use

The use of a hydrologic engineering management plan is threefold. It is the following:

a. Basis for firm time and cost estimates. Accurate estimates cannot be obtained without taking sufficient time to develop firm and justifiable estimates for the feasibility or the preconstruction engineering and design (PED) phase. The HEMP should reflect the hydrologic information needs of the study team and define the method of proceeding through the entire study process. Agreement between hydrologic engineering, planning, and project management on the study scope must be reached for an accurate cost estimate. The HEMP should be viewed as a contract to perform the stated work for the agreed-upon amounts of funds and time. Written records and daily or weekly logs of accomplishments are important to properly manage and track the study time and fund expenditures throughout the study.

b. Technical guide for the hydrologic engineer. Many feasibility-phase or PED investigations require two or more years of hydrologic engineering effort. Even an experienced hydrologic engineer cannot foresee all facets of a multi-year study without significant planning and input from others. A detailed technical outline allows work to be performed effectively and efficiently, without close supervision. The preparation and use of a HEMP provides inexperienced hydrologic engineers with a clearer understanding of the analysis procedures and reporting process. A HEMP provides the basis for meaningful discussion and negotiation and helps in making decisions on refinements and changes as the study progresses.

c. Review contract. The HEMP provides the contract that will be used to guide the review of the hydrologic engineering final project.

2-3. Personnel Involved

The HEMP is a hydrologic engineering document usually prepared by the principal engineer for the study. It is not required or approved by other disciplines, but must incorporate information needs of all disciplines. The hydrologic engineer plays the most important role in its development, but others have input as well. They include:

a. Senior personnel--the HEMP may be prepared by an experienced engineer or a section chief to ensure that the time and cost estimates are adequate and that they address all study issues. Supervisors should review and critique the HEMP.

b. Project manager (PM)--discussions on the effect of the HEMP to the overall project schedule, cost, budget, and all other project processes should be held with the PM that is responsible for the progress of the project.

c. Planning technical manager--discussions with the planning technical manager on the alternatives to be addressed, level of detail, combinations of different alternatives, study milestone dates, and other pertinent information should be held, agreed upon, and incorporated into the HEMP.

d. Economist--the economist is important in establishing the type of analysis required. Significant agricultural damages require knowledge of the time of year and duration of the flood and typically use a continuous simulation analysis. A study area with primarily urban damages could use an event analysis. Information on damage reaches is necessary to estimate the location of hydrologic computation points to give stage-frequency information at designated damage centers. This type of information is required to perform risk-based analysis for project alternatives in close coordination with economists and all other team members.

e. Local sponsor--the sponsor almost always has useful hydrologic information on the study area. The sponsor may also have definite views on the type and size of flood damage alternatives most suitable for the investigation.

f. Cost engineer--the cost engineer must have hydrologic engineering design information in sufficient detail to prepare project costs.

g. Realty specialist--the real estate specialist needs stage-frequency, area inundated, project location, and other information to complete the analysis.

h. Other team members--structural, geotechnical, mechanical engineers, regulatory personnel, the recreational planner, and environmental specialist usually need specific information from the hydrologic engineer.

i. Review authority--controversial, complex, or costly hydrologic analyses should be discussed with Division and possibly HQUSACE hydrologic engineering personnel to confirm the approach and procedures proposed. This should be accomplished both informally and through the mandatory technical review conferences. These disciplines should be contacted, as necessary, during the reconnaissance-phase study to ascertain their needs and views on hydrologic information required for the feasibility-phase investigation.

management plan (IPMP), or the detailed project design needed in the project management plan (PMP). The HEMP should be prepared at the end of the reconnaissance study so that time and funds needed may be firmly estimated during the feasibility-phase study. It becomes part of the IPMP forming the basis for the Feasibility Cost-Shared Agreement (FCSA). Similarly, a HEMP is prepared at the end of the feasibility-phase study to establish hydrologic engineering time and costs necessary for PED. HEMPs are prepared during the feasibility phase, to detail all hydrologic engineering work necessary during feasibility, and during the PED phase for the balance of the hydrologic engineering effort. It is assumed throughout this document that both HEMPs will be prepared, but this does not mean that both are always required. In fact, if a detailed hydrologic engineering management plan can be developed at the end of the reconnaissance phase, it should be done. A sequence for developing hydrologic engineering management plans is shown in Figure 1.

2-4. HEMP

The HEMP should outline feasibility study hydrologic engineering activities to be included in the initial project

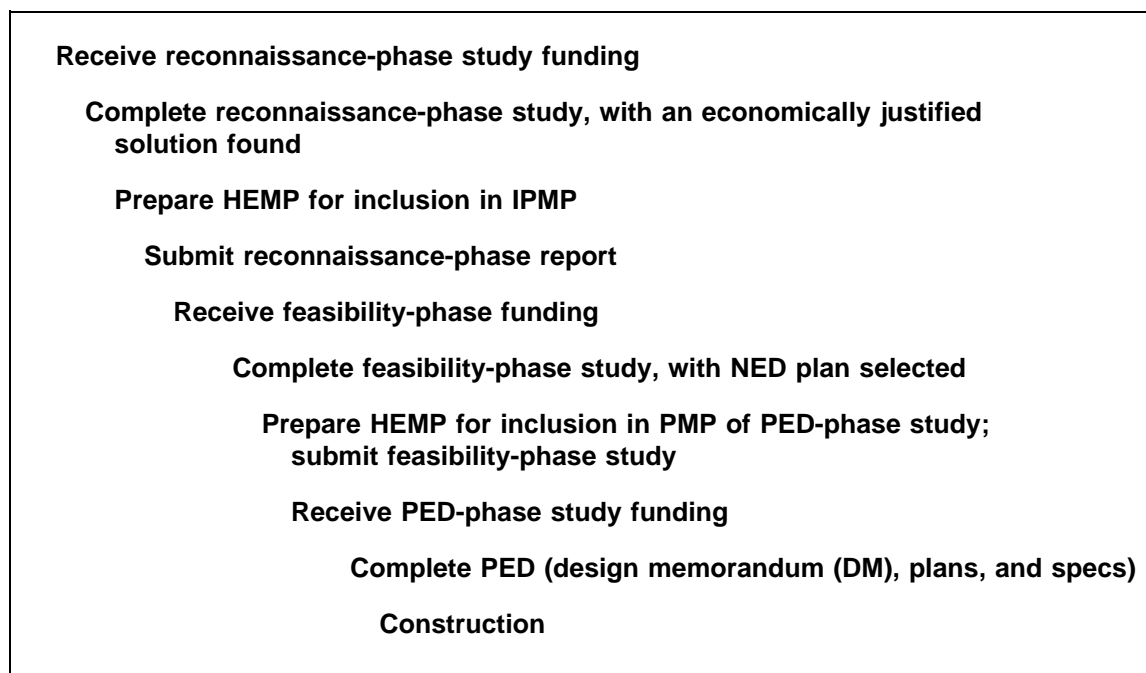


Figure 1. Sequence of hydrologic planning activities for Civil Works studies